PH.D. SYNOPSIS

ON

RENEWABLE ENERGY PROPAGATION AND SECURITY IN INDIA: A COMPARATIVE STUDY

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INTRODUCTION

With a population of 1.4 billion and one of the world's fastest growing economies, it is positively anticipated that India will develop majorly in the energy sector.[1] The laws that govern the use, regulation, conservation and distribution of energy resources is known as energy laws. The large utilization of energy in India is done on the consumption of coal for power generation, biomass for household cooking, oil and petroleum for transport and tertiary sector and even solar panels and wind energies are being used for effective dissemination**.** The main production of energy resources in India is coal and biomass. But a large quantity of oil and natural gas is imported from other oil producing countries.[2]

India has invested hugely in thermal and renewable energy resources which has improved the electricity security in India by establishing a single national power system. If we have to meet the expected deadlines to implement the Solar and Wind energy, it is expedient in the interest of the citizens that investments should be initiated in this sector. The capacity of non-fossil fuels is 38% in India, adding nuclear and hydro converted energy and it has pledged to increase this contribution to 40% as submitted to UNFCCC in 2015 as part of the Paris Agreement. The solar and wind energy installations are rising in the country and the above set target will be on zenith before 2030. [3] Wind energy, Solar energy and Hydropower energy are some of the renewable energy sources which will shape the entire face of energy consumption in India if utilized properly. [4]

India lacks policies on the matters of renewable energy sources but there are some legislations which has promoted the regulation of renewable energy sector.[5] The Electricity Act, 2003 is the first legislation which deals with the usage of renewable sources of energy for producing electricity. Section 61(h) of the Electricity Act, 2003 mandates the State Electricity Regulatory Commissions (SERCs) to encourage the grid connectivity of the electricity which has been

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[1] IEA, India 2020, Energy Policy Review, International Energy Agency, NITI AAYOG, 2020.
Hg.org legal resources, Energy Law - HG.org.
[2] *Ibid.*
[3] Tejal Kanitkar, Is India Concerned about its Energy Security? The India Forum, Is India Concerned about its Energy Security? | The India Forum, 25th September, 2020.
[4] *Ibid.*
[5] IEA, India 2020, Energy Policy Review, International Energy Agency, NITI AAYOG, 2020.

generated from renewable resources by way of tariff regulations. Section 86(1)(e)[6] makes it mandatory for the State Electricity Regulatory Commissions (SERCs) to specify a minimum level of purchase obligation of renewable power[7]. The efforts which were made for the commercialization and industrialization of renewable energy were reinforced by the National Electricity Policy, 2005. Section 6.4(1) of the National Tariff Policy, 2006 lays down certain guidelines for the SERCs for the fixation of renewable purchase obligations at the state level.[8]

The Ministry of New and Renewable Energy (MNRE) is also working for policies in the renewable energy sector. The Draft National Renewable Energy Act 2015 aims to promote the production of energy through the use of renewable energy sources in accordance with climate, environment and macroeconomic considerations in order to reduce dependence on fossil fuels, ensure security of supply and reduce emissions of CO2 and other greenhouse gases.[9] At many instances the judiciary of our country has dealt with issues revolving around renewable energy resources. Recently in 2015, the Supreme Court ruled that all industries shall come on board with targets regarding renewable sources of energy or otherwise get fined.[10]

China's budget for renewable energy sector is 128 times more than what we have for India. The Goods and Service tax (GST) which has increased costs on majority of the goods and products has also worsened the growth of renewable energy sector in India.[11] If we invest in green technology then India is in a very promising position to achieve its target of zero carbon emission by the year 2030. The government is trying to have an ecosystem which is transitioning from non-renewable to a sustainable clean energy system. According to the report given by University of Technology (LUT) in Finland, which was due to the finding that we have an abundance of renewable resources, there is a high possibility for India to move into a fully renewable electricity system by the year 2050.[12]

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[6] The Electricity Acy, 2003.

[7] Aparna Sawhney," Renewable Energy Policy in India: Addressing Energy Poverty and Climate Mitigation", Research Gate, June 2020, https://www.researchgate.net/publication/275146685_Policy_Monitor_Renewable_Energy_Policy_in_India_addressing_Energy_Poverty_and_Climate_Mitigation.

[8] Mayank Hitesh Thanki, Renewable Energy Laws in India, International Journal of Law Management & Humanities [ISSN 2581-5369], Volume 3 Issue 4, 2020.

[9] Draft National Renewable Energy Act 2015, Draft National Renewable Energy Act 2015 | ESCAP Policy Documents Managment (asiapacificenergy.org)

[10] Deepak Sriram Krishnan, "India's Supreme Court Reinforces Renewable Energy Targets for Industry", World Resources Institute.

[11] Kumar. J, C.R., Majid, M.A. Renewable energy for sustainable development in India: current status, future prospects, challenges, employment, and investment opportunities. *Energy, Sustainability and Society* 10, 2 (2020). https://doi.org/10.1186/s13705-019-0232-1.

[12] Guatam Khurana, Renewable Energy in India: Current Status and Future Potential, Indiary Foundation, 2018, https://www.indiary.org/en/legal-advice/Renewable-Energy-in-India-Current-Status-and-Future-Potential-2-79-429.

STATEMENT OF PROBLEM

There is an increased dependence on imported coal, leading to high power generation costs and gruesome effect on the environment. And it is in disguise that despite of production of electricity in huge capacities, the rural population is not getting the benefit of it. It is high time that renewable energy sources should be installed and legal fraternity must join hands to implement goal-oriented laws and policies. Electricity created through solar panels, wind energy, tidal energy and hydro power has to be promoted with stringent laws. Trade duties on imported solar modules have proven to be counterproductive and disruptive. This has led to slowed down solar installs.

The central and state governments have not coordinated well in matters relating to renewable energy. This creates confusion, delays, and mismanagement in auctions, transmission connectivity, and land acquisition-related issues between the central and state projects relating to renewable energy. Therefore, insufficient laws related to renewable energy sector in India has led to a significant shortage of manpower in both the power and construction sectors. Encouraging implementation, monitoring and compliance of a broad set of power quality norms and standards for renewable energy sector at state level, district level and village level through state regulators, is the need of the hour in order to produce cost-effective supply to households and industry and their associated economic losses. The accidents in the booming renewable energy industries can negatively impact people, animals, and buildings in social systems and ecosystems. Many studies focus on the renewable energy incidents in a single wind-based, solar-based, or hydro-based system, and lack holistic views of incident risk management covering all the systems.

In Section 2(b) of the Environment Protection Act, 1986, there is no particular mention of power plants. There is a generic mention of the term ‘pollutants’, which is neutral to the origin of the same. Now the primal question to be answered is where to implicate liability, at the point of creation of energy, where there is substantial pollution or at the point of its usage, where it trickles down to pollution coupled with environment disruption and degeneration? A progressive and stringent approach would be to protect at both ends.

AIMS AND OBJECTIVES

- To analyse the existing legal policies related to renewable energy sector in India.
- To compare the laws of India related to renewable energy sector with that of Sweden and China.
- To evaluate the judicial approach towards propagation and security of renewable energy laws in India.
- To understand the development of Global Energy-Arbitration as an alternative dispute resolution mechanism.
- To suggest recommendations related to implementation of policies for attaining efficiency in renewable energy sector in India.

HYPOTHESES

- The growth of renewable energy sector in India has widened the scope of right to clean energy in India.
- Sustainable Development Goal of zero carbon emission depends on security and propagation of renewable energy sector.
- The investments and cross border partnerships in renewable energy sector has increased due to implementation of national policies in India.

RESEARCH QUESTIONS

Followings are the concerned issue to be explored to practically and effectively address the underlying issue related to the research topic:

- What changes can be proposed in the policies for ensuring efficiency of renewable energy sector in India?
- What are the lacunae behind unequal distribution of energy resources in India and how can they be curbed?
- What are the laws which can be introduced in the Indian legislature for creating security of renewable energy in India?
- How can we create a balance between the societal interest, individual interest and the economic interest with respect to the transition and consumption of renewable energy resources?

SIGNIFICANCE OF THE RESEARCH

The researcher is of the view that there is a need to ensure the continuity of demand and supply of renewable energy sector both in urban as well as rural population in India. Energy policy is important to be recognized because economic factors alone do not determine the outcome in the energy sector. Governments have taken the responsibility for ensuring that the outcomes in the energy sector are consistent with a range of social objectives. Therefore, the first and foremost significance of this research is to promote new policies for renewable energy resources in India. The researcher shall emphasize on the modes of renewable resources in India like solar energy, wind energy, hydro power energy, tidal energy, etc. and implementation of the already existing policies and recommendations with respect to new policies so that it is equally viable for the economy as well as the societal interest at large.

Recently, the Government of India has inaugurated the Green Hydrogen Mission which is pertinent for producing renewable energy. The big industrialists of our nation and major companies are encouraged to invest in projects like Green Hydrogen mission and International Solar alliance to give a boost to the energy economy but certain amount of legal security should be provided to these companies so that they can invest in these sectors hassle free. This creates a scenario where the requirement of legal provisions related to energy law is felt.

Japan through its Institute of Energy Economics (IEE) was able to successfully transfer 50 tons of Ammonia for zero carbon energy production as a sustainable use of renewable energy. Even India can utilise such methods to produce electricity and be a part of global circular carbon economy. The researcher shall understand the energy laws of various countries and compare the same by the existing policies of India in implementing efficient measures and policies for proper utilization of the renewable sources. The right to energy has not been considered as a Human Right by Universal Declaration of Human Rights neither it is specifically stated as a Fundamental Right in the Constitution of India, therefore, researcher is of the view that after a thorough research in the energy laws it shall be imperative to understand whether a separate Fundamental Right for right to energy in India is required or not.

Energy law is both a legal discipline as well as a normative system which has three key roles in the energy transition. First, energy law can be facilitative, in which case it helps to spur the action needed in the energy transition. For example, some legal frameworks have created the concept of guarantees of origin, which are electronic documents designed to provide a final

customer evidence that a specific quantity of energy was produced from renewable sources. As tradeable documents, guarantees of origin generate economic value for renewable energy producers, thereby giving them a competitive advantage, but only exist because of a legal obligation. Second, the role of energy law can be restrictive, in which case it sets boundaries, constraints or even outright prohibitions in relation to the developments needed in the energy transition. In its most modest form, a restriction can be the result of a legal instrument that sends signals that discourage activities that would otherwise be desirable in the energy transition. For example, zoning laws or environmental permit procedures can discourage, delay or even prevent renewable energy projects from being realized. Therefore, it is pertinent to form regulations on these aspects of energy law comprising of propagation and security in India.

LIMITATIONS OF THE RESEARCH

The researcher has opted for doctrinal method as the researcher has observed that there are many sources available in order to have a comparative study on this topic. Journals, articles, case laws, government policies, Bills, etc. which shall aid the researcher to come to a conclusion as to how we can propagate and secure the renewable energy sector in India.

The researcher has focussed on Sweden and China because both the countries have grown in the energy sector owing to its huge resource of moving water and biomass. They use hydropower for electricity generation and bioenergy for household activities. The government of Sweden has taken care of the renewable energy system in the country widely. Green electricity certification is one of the important policy decisions which has helped Sweden to change its energy demands from non-renewable to renewable. Electricity retailers are required to buy a proportion of 'green electricity' as part of their normal supply, while power producers receive certification for the renewable electricity they generate. This development has overall increased the utilisation and mobilisation of Renewable energy in their country. Therefore, researcher is going to compare the policies of Sweden regarding renewable energy with that of policies made in India. China is now the undisputable global leader of renewable energy expansion worldwide, and the IEA forecasts that by 2021, more than one-third of global cumulative solar PV and onshore wind capacity will be located in China. Therefore, a comparative study of the laws of both the countries i.e., Sweden and China with that of India shall aid the researcher to understand the gap India is facing as a developing nation in renewable energy sector.

The researcher shall face issues in evaluating the availability of renewable resources on a large

scale on which the future policies shall be based. In order for intermittent renewable energy sources such as solar panels to effectively compete with fossil fuels like coal, both the price of installed solar panels and the price of battery storage will need to reduce by a full order of magnitude. In addition, optimistic long-term projects state that both solar panels and battery storage will reach technological maturity at roughly triple the cost of their fossil fuel counterparts.

Transportation depends almost entirely on liquid fuels derived from petroleum. Coal and natural gas are now important for electric production but they could conceivably be replaced by renewable or nuclear energy in the long term. However, it is not easy to imagine alternatives to the use of petroleum by-products for transportation. All of these involve very far-reaching changes.

Hydroelectric power has the greatest presence and its resources have been used in the most complete way, but other renewable energies, such as wind and solar power, have advantages and disadvantages. Their disadvantages fall into two categories i.e., high cost and intermittence. The high expense of renewable energies is also due, in part, to the fact that the technology associated with it is still not very advanced. In that sense, the way to diminish costs derived from the lack of technological development is to create a worldwide market.

Energy poverty is widely seen in India. The scheme for distribution of renewable energy resources to every set of population is difficult. The research will be focussed on how effectively dissemination of heat, power and electricity can be persuaded to every corner of this country through enactment of various policies.

RESEARCH METHODOLOGY

The researcher shall use doctrinal method to understand the entire legal structure related to right to clean, affordable and accessible renewable energy. The primary source will comprise of analysing the constitutional mandate, existing statutes, judicial observations and judgements along with the case comments by distinguished jurists and reports submitted by various agencies. The research methodology is predominantly doctrinal in nature in terms of reviewing international covenants, legislations in India and laws of various jurisdictions. Books will be perused and various reports of different forums will be perused.

As the study shall analyse the entire evolution of renewable energy and policy not only in India but also at international forums this approach is only approach to justify the needs of the study. Most of the information is authoritative in nature it can be said primary data will be the priority of the researcher but the places where researcher shall be analysing the legal articles, research

paper, case comments, news reports, etc. The researcher shall perform a comparative study of renewable energy policies in India with Sweden and China as these countries have a huge market in renewable energy sector and their policy goals are promising and is eight years ahead of its target to make their country 100% renewable.

REVIEW OF LITERATURE

On the basis of the review of the following mentioned literature the present research work is being carried out in order to appreciate the importance of the Judicial Pronouncements, Reports, Articles and Books. Various Ministries under Government of India like Ministry of Power, Ministry of New and Renewable Energy are working for encouraging renewable resources and laws pertaining to it. The ministry has categorised the non-conventional energy as solar energy, wind energy, small hydro energy, waste to energy and bio energy. India has the highest growth rate in terms of renewable energy.

Articles:

The first question which needs to be addressed by the researcher is what is the legislative definition of Renewable Energy? As mentioned by Crossley, Penelope in his article ***"What Is 'Renewable Energy'? – Conceptualizing the Legislative Definitions of Renewable Energy",*** it is pertinent to understand that the approach of coming at a decision of finalising a definition varies in legal systems. Every definition contains the ideas associated with the history and political debate of the country or jurisdiction concerned. Russia includes the formation of gas in its definition of Renewable energy whereas Ecuador inhibits nuclear energy in the definition of renewable energy sources. It completely depends on the semantics of a nation state to come up with an exhaustive definition.

K. Silvo, M. Melanen, A. Honkasalo, S. Ruonala, and M. Lindström in their ***Integrated pollution prevention and control — The Finnish approach,*** has done an analysis of the accredited and registered projects which shows that the wind sector in Maharashtra and Tamil Nadu is leading in terms of number as well as capacity. This can be attributed to the amenable local conditions in these areas. The Ministry of New and Renewable Energy released the Draft National Offshore Wind Energy Policy in 2013. This policy gives further impetus to developing offshore wind energy projects in Kerala, Karnataka, Goa, Tamil Nadu, and Gujarat. The Solar PV projects are highest in Rajasthan due to the availability of vast open spaces where solar

panels can be setup. Himachal Pradesh reports maximum Small Hydro projects due to its strategic geographical location. [13]

According to an article on **"*Current scenario of renewable energy in India*"** it was observed that India has achieved a cumulative installed renewable energy capacity of 92.54 GW out of which 5.47GW was recently added in the period April 2020 till January 2021.[14] Although other sectors of the industry was affected due to the Covid-19 pandemic but the same cannot be said for the energy sector. The Government of India had set a target that 175 GW renewable power will be installed in the country by the year 2022, but this goal is difficult to achieve. The various parts required for installing solar power is imported from China and since during the lockdown the transactions of goods between India and China was limited, it became impossible to get a control on the renewable energy market.[15]

R. N. Stavins, who wrote an article on ***Experience with market-based environmental policy instruments*** says that any market-based or conventional policy instrument cannot be appropriate for all environmental problems, with the best choice depending upon the characteristics of the specific environmental problem, and the social, political, and economic context

All the efforts undertaken to minimize energy usage, enhance energy efficiency, and promote the use of clean energy will contribute towards reducing the emissions intensity of India's GDP by 33 to 35 percent by 2030 from2005 level as proposed in the Intended Nationally Determined Contributions (INDC) submitted to the United Nations Framework Convention on Climate Change.[16]

Another article written by Aparna Sawhney on **"*Renewable Energy Policy in India: Addressing Energy Poverty and Climate Mitigation*[17]"** majorly focusses on the laws and policies in India relevant to the energy sector which also includes issues of energy poverty faced by India and the climatic conditions by usage and consumption of environment degrading

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[13] K. Silvo, M. Melanen, A. Honkasalo, S. Ruonala, and M. Lindstrom, ―Integrated pollution prevention and control — The Finnish approach, Resour. Conserv. Recycle., vol. 35, no. 1-2, pp. 45–60,2002.

[14] Tushar Shetty, Chirah Shetty, Ishaan Shah, Current scenario of renewable energy in India, International Research Journal of Engineering and Technology (IRJET), Volume: 08 Issue: 10 | Oct 2021, https://www.irjet.net/archives/V8/i10/IRJET-V8I10120.pdf.

[15] *Ibid*.

[16] R. N. Stavins. (2001). Experience with market-based environmental policy instruments. resources for the future. [Online]. Available: http://www.rff.org/documents/rff-dp-01-58.pdf

[17] Aparna Sawhney," Renewable Energy Policy in India: Addressing Energy Poverty and Climate Mitigation", Research Gate, June 2020. https://www.researchgate.net/publication/275146685_Policy_Monitor_Renewable_Energy_Policy_in_India_addressing_Energy_Poverty_and_Climate_Mitigation.

resources. The author has discussed the problems faced by women in the rural area with respect to cooking on biogas which consequently proves to be unhealthy and toxic because of the gases which are released in the air. The women who are inhaling these obnoxious gases face respiratory issues as well as ailments like Cancer, Tuberculosis, etc. More or less their right to health enshrined under Article 21 of the Constitution is compromised. Therefore, the right to energy also includes the right to clean and affordable energy and is very much a part of the fundamental rights incorporated in Part III of the Constitution.

Mayank Hitesh Thanki, who has comprehensively written an article on ***"Renewable Energy Laws in India"*** [18]has discussed the policies of renewable resources and supreme court cases. The guidelines which are issued time and again to discuss the potential risks involved if we do not have a stringent policy with respect to implementation of renewable energy sector. Making energy clean, accessible and affordable is not only a fundamental right but also the directive principle of state policy. There is a high significance of renewable resources in India as we have abundant resources to fulfil this target. Sunlight in India is found throughout the year, making it possible to have a sustainable solar energy system in various parts of urban and rural population. But because of lack of dedicated legislation on the issue, there are certain limitations on implementing the renewable energy in India on a large scale. It also contains the International Agreements related to climate change and energy consumption. **[19]**

Singh Kirti, on the other hand has mentioned about the foreign investments and problems related to installation of energy resources in her article named ***"Competition Issues in Energy Sector in India: A Critical Legal study*****.** **[20]** As we all know after the year 1990 when we were progressing in the area of LPG: Liberalisation, Privatisation and Globalization, there were number of investors who believed in the economy and resources of India. With the similar objective, we are open for the foreign investors to invest in the renewable energy sector but at the same time if we are able to provide them security in terms of legal provisions and a comprehensive system of arbitration, this will increase the potential investment and finances in the sector. [21]

[18] Mayank Hitesh Thanki, Renewable Energy Laws in India, international journal of law management & humanities [ISSN 2581-5369], Volume 3 Issue 4, 2020.
[19] *Ibid.*
[20] Singh Kirti, Competition Issues in Energy Sector In India A Critical Legal Study, journal of law management & humanities [ISSN 2581-5369], Volume 3 Issue 4, 2020.
[21] *Ibid.*

Tejal Kanitkar, in her article **"Is India Concerned about its Energy Security?"** [22] mentions that the policies of India are not up to the mark to sort out problems on base level which includes the rural population of this country. Production of heat and electricity by using renewable is a challenge and implementation of laws with respect to energy security will exuberantly uplift the said drawback. Absence of laws and policies in the area of renewable energy has proved to be detrimental to the advancement of renewable technologies overall. [23]

In another Article of titled as "***Physics of transparent conductors"***, the author has mentioned that while the energy transition has been analysed from a plethora of initiatives and interests, including law as a discipline, there is a lack of understanding of the working law in this body of research and in the energy transition, even though law has indisputable effects on the energy transition, we have not come up with certain acts or regulations with respect to energy law. This article addresses this knowledge gap by exploring the roles of energy law in the energy transition and the implications for energy research. The article is based on a qualitative analysis of literature in the intersection between energy law scholarship, jurisprudence and energy research.[24]

"Reasonable Price for Electricity" **by B.S. Pront-van** shares some insightful discussions on the issues related to legal doctrinal energy law scholarship which focuses on the identification, interpretation and systematization of the relevant rules for the energy sector. Examples abound. A research group may be faced with a research question concerning why energy network tariffs are set at a certain level. A doctrinal researcher would approach this question by identifying the energy laws in force that apply to energy networks. Around the globe, these laws often require that tariffs recovered for the usage of energy infrastructures should be *reasonable*[25].

An article written by **W. Fisher, M. Horwitz, T. Reed (Eds.) titled as "*American Legal Realism*", Oxford University Press (1995)** talks about giving recommendations on how laws should be interpreted or changed, doctrinal energy law scholarship does not empirically measure the effects of laws. Instead, it uses the authoritative legal sources, in tandem with the internal

[22] Tejal Kanitkar, Is India Concerned about its Energy Security? The India Forum, Is India Concerned about its Energy Security? | The India Forum, 25th September, 2020.
[23] *Ibid.*
[24] J. Gao, K. Kempa, M. Giersig, E.M. Akinoglu and B. Han, R. Li, Physics of transparent conductors Adv. Phys., 65 (6) (2016), pp. 553-617.
[25] B.S. Pront-van, Reasonable Price for Electricity, J. Consum. Policy, 39 (2016), pp. 141-158.

logic of the legal system, to prescribe how a legal norm should be interpreted. This approach has important consequences for what can and cannot be inferred from the results of such research. It has been aptly pointed out that, in doctrinal scholarship, law 'is treated as a sealed system which can be studied through methods unique to the "science of the law" and legal developments can be interpreted, critiqued, and validated by reference to the internal logic of this sealed system.[26]

There is a requirement of notable investors in the market of renewable energy and that will be possible only if we have certain procedures and guidelines ready for the smooth functioning of this area. R&D can help in improving the infrastructure and innovation of new technologies to identify the renewable energy propagation methods but a lack of a legal system is creating a hitch in the growth of the said sector. Therefore, to comprehensively calculate the risks and making the sector cost effective and also to ensure that investors have faith in the system, it is the need of the hour to introduce new rules with respect to renewable energy industry. This was observed in an article written by Kumar. J, C.R. and Majid, M.A. on ***"Renewable energy for sustainable development in India: current status, future prospects, challenges, employment, and investment opportunities."*** [27]

A.J. Bradbrook in his ***"Energy Law as an Academic Discipline"***, the author has had an active discussion in energy law scholarship on what makes energy law a legal discipline. As a result, energy law has been focusing on the principles such as national resource sovereignty, energy justice and combating climate change as key elements of energy law. It has also taken up energy law as an inherently interdisciplinary field whose scope is defined by its huge relationship with the problem-based approach.[28]

L. K. Price and A. T. McKane in the year 2008 wrote an article on ***Policies and measures to realise industrial energy efficiency and mitigate climate change***. They talked about the energy efficiency is commonly seen as the most economical, minimally polluting, and most readily-available energy saving option existing in the industrial sector worldwide, which can contribute

[26] W. Fisher, M. Horwitz, T. Reed (Eds.), American Legal Realism, Oxford University Press (1995).
[27] Kumar. J, C.R., Majid, M.A. Renewable energy for sustainable development in India: current status, future prospects, challenges, employment, and investment opportunities. *Energy, Sustainability and Society* 10, 2 (2020).
[28] A.J. Bradbrook in his Energy Law as an Academic Discipline, J. Energy Nat. Resource. Law, 14 (2) (1996), pp. 193-217.

to development goals related to reducing poverty and to the global sustainability goals related to reducing emissions.[29]

Books:

A Book on ***"Legal Issues in Energy Sector"*** by Renewable Energy in India, Economics and Market Dynamics written by Mr. Pramod Deo, Former Chairman of CERC, India talks about the present laws related to energy sector. The Electricity (Amendment) Bill, 2014 is also discussed herein. Pursuant to the recommendations of the Standing Committee on Energy, the Ministry of Power introduced a draft of Electricity (Amendment) Act, 2018 (2018 Bill) in September, 2018. The Book discussed certain significant aspects evolution of power sector, structural reforms required in the power sector, business models related to dynamics of renewable energy market, pricing of renewable resources, Renewable Energy Certificate (REC), etc. [30]

Mohammad Naseem wrote a book named ***"Energy Law in India***" which provides a systematic approach to legal system focussing energy resources and production in India. The book describes the administrative organization, regulatory framework, and relevant case law pertaining to the development, application, and use of such forms of energy as electricity, gas, petroleum, and coal, with attention as needed to the pervasive legal effects of competition law, environmental law, and tax law. A general introduction covers the geography of energy resources, sources and basic principles of energy law, and the relevant governmental institutions. Then follows a detailed description of specific legislation and regulation affecting such factors as documentation, undertakings, facilities, storage, pricing, procurement and sales, transportation, transmission, distribution, and supply of each form of energy.[31]

A book on Renewable energy resources, challenges and application, Chapter 2 titled as "***Energy Security and Renewable Energy: A Geopolitical Perspective*** by John A. Paravantis and Nikoletta Kontoulis talks about the role of renewable energy in shaping energy security against the backdrop of global geopolitical, socioeconomic, and technological uncertainties. Security indexes of other countries are discussed taking into account the growth of sustainable

[29] L. K. Price and A. T. McKane. (2008). Policies and measures to realise industrial energy efficiency and mitigate climate change. UN-Energy Energy Efficiency Cluster. [Online]. Available:http://www.unido.org/fileadmin/user_media/Services/Energy_and_Climate_Change/EPU/UN%20Energy%202009%20Policies%20and%20Measures%20to%20realise%20Industrial%20Energy%20Efficiency%20and%20mitigate%20Climate%20Change_small.pdf.

[30] Pramod Deo, Renewable Energy in India Economics and Market dynamics, September, 2021.

[31] Mohammad Naseem, Energy Law in India, June, 2021, ISBN: 9789041189363.

development worldwide. [32]

Olivia Woolley, who is an Associate Professor in Bio Law at Durham Law School, UK, has written a book on ***"Renewable Energy Law"*** which focusses on the international, regional and national legal frameworks related to renewable energy law. The book also gives light upon the security, investment, planning, licensing and public opposition regarding renewable energy resources. [33]

Judgments:

Important landmark judgments like ***Solar Energy Corporation of India Limited v. Wind Four Renergy Private Limited, 2024 SCC Online SC 219*** imposes timelines on the renewable energy projects for due completion as the purpose of timelines is to ensure early supply of green energy and reduction of carbon footprint. The Supreme Court held Solar Energy Corporation of India Ltd. is entitled to recover the bank guarantee amount of Rs.10 crores along with simple interest at 12% per annum, to be paid within 6 months.

In the case of ***M/S. Dakshin Gujarat Vij Company Limited v. M/S. Gayatri Shakti Paper and Board Limited and Another, etc., 2023 SC***, the Supreme Court clarified the rules governing captive power users, ensuring transparency and preventing misuse, while also shedding light on the role of Special Purpose Vehicles (SPVs) in the power generation landscape. The decision is expected to have a substantial impact on the energy sector in India.

The Supreme Court in the case of ***M.K. Ranjitsinh & Others V. Union of India,*** 2021 SCC Online SC 326, 2021 SC, sought the views of the Union Government on striking a balance between the need to protect the Great Indian Bustard, an endangered bird, and India's international commitments toward lowering the carbon footprint through solar energy.

In the case of ***Hindustan Zinc Ltd. v. Rajasthan Electricity Regulatory Commission*** decided by the Supreme Court in the year 2012 factually ordered the compliance of the regulations made for renewable energy propagation. The High Court of Rajasthan passed a judgment wherein the companies having captive generation power plants were ordered to purchase minimum energy

[32] John A. Paravantis and Nikoletta Kontoulis, Energy Security and Renewable Energy: A Geopolitical Perspective, Pg No. 19, Edited by Mansour Al Qubeissi, Ahmad El-kharouf and Hakan Serhad Soyhan, eBook (PDF) ISBN 978-1-83962-155-0.

[33] Olivia Woolley, Renewable Energy Law, Bloomsbury Publishing, April 2023.

from renewable sources. The Rajasthan Electricity Regulatory Commission (Renewable Energy Obligation) Regulations, 2007 and Rajasthan Electricity Regulatory Commission (Renewable Energy Certificate and Renewable Purchase Obligation Compliance Framework) Regulations 2010 imposed Renewable Energy obligation (RE obligation) on the captive generation entities to purchase minimum energy from renewable sources and to pay a surcharge in case of shortfall in meeting the RE obligation.[34]

Further, the National Electricity Policy, 2005 and the Tariff Policy, 2006 were framed to promote production and utilization of energy to the maximum extent in respect of the captive generation plants. It was not intended to compulsorily force these companies to lower their production of energy by making them purchase renewable energy. Consequently, the 2007 and 2010 Regulations violated the basic object and purpose of the Electricity Act 2003.[35]

The moot issue in this case relates to whether the aggrieved captive power plant companies are covered by the 2007 and 2010 regulations that mandate green power purchase. On 13 May 2015, the Supreme Court of India upheld the validity of the 2007 and 2010 Regulations with respect to the renewable energy purchase obligation. The court approved the promotion and co-generation of electricity from renewable source of energy by employing constitutional mandates that focus on larger public interest and clean environment. The State and its instrumentalities are under a duty to protect the environment in order to ensure that the citizens/residents of the area lead a healthy life. This is the laudable object of the State and to achieve the same it has framed the respective electricity policies and regulations. Accordingly, the Supreme Court observed "the National Action Plan on Climate Change and Preamble of the Act of 2003 emphasises promotion of efficient and environmentally benign policies to encourage generation and consumption of green energy to sub-serve the mandate of Article 21 read with Article 48A of the Directive Principles of the State Policy and Article 51A(g) of the Fundamental Duties enlisted under Chapter IVA of the Constitution of India. Further, the said Regulations are consistent with the international obligations of India, as India has ratified to the Kyoto Protocol."[36]

The Supreme Court of India in the case of ***MK Ranjitsinh & Others v. Union of India***, dated 19 April 2021, decided that the great Indian bustard (GIB) has been identified as a critically

[34] *Ibid.*
[35] *Ibid.*
[36] *Hindustan Zinc Ltd. v. Rajasthan Electricity Regulatory Commission, AIR 2012 SC.*

endangered species in India. On 19 April 2021, the Supreme Court passed an order classifying certain areas as priority areas and potential areas of GIB habitat, requiring undergrounding of all future and existing low-voltage lines in such areas. Similarly, for future and existing high-voltage lines, the order mandated that these lines be converted into or laid as underground lines unless a Supreme Court-appointed committee determines that this is not technically feasible. In such a case, only bird diverters will be installed. The order is crucial as it will cause an increase in the project cost for projects that were situated in the identified GIB habitats, which are in the states of Rajasthan and Gujarat, both of which are known for them RE potential.[37]

Subsequently, the MNRE filed a review petition contending that the undergrounding of transmission lines was unfeasible due to logistical complexities and cost implications. The Supreme Court, in its 21 April 2022 order, ordered that the installation of bird diverters is mandatory for overhead transmission lines in the GIB priority areas and developers seeking an exemption from undergrounding the transmission lines may move the committee constituted by the Supreme Court. The matter is listed for further directions on 20 July 2022.[38]

[37] Supreme Court of India, IA No. 85618 of 2020 in Writ Petition (Civil) No. 838 of 2019, *MK Ranjitsinh & Ors v. Union of India*, dated 19 April 2021, available at https://main.sci.gov.in/supremecourt/2019/20754/20754_2019_31_1502_27629_Judgement_19-Apr-2021.pdf.
[38] *Ibid.*

PROPOSED CHAPTERISATION

CHAPTER 1	Introduction
CHAPTER 2	History, Origin and Development of Renewable Energy Sector in India
CHAPTER 3	National Policies Guiding the Renewable Energy Sector in India
CHAPTER 4	Comparative study of Energy Laws of India with Sweden and China
CHAPTER 5	Judicial Approach Towards Renewable Energy Laws in India
CHAPTER 6	Conclusion and Suggestions

BIBLIOGRAPHY

National legislation:

- The Constitution of India, 1950
- The Electricity Act, 2003
- Electricity (Amendment) Rules 2022

National Schemes and Policies:

- PM Surya Ghar Muft Bijli Yojna
- National Green Hydrogen Mission
- International Solar Alliance
- Solar PV Module PLI scheme
- PM Kusum

Books

- India: Energy Laws in India by Piyush Joshi**,** RV Anuradha and Sumiti Yadava, 21 January 2020
- Mohammad Naseem, Energy Law in India, 3rd Edition
- Pramod Deo, Renewable Energy in India Economics and Market dynamics, September, 2021
- Crossley, P. (2019). Renewable Energy Law. In Renewable Energy Law: An International Assessment (pp. I-Ii). Cambridge: Cambridge University Press.

Articles

- A.J. Bradbrook in his Energy Law as an Academic Discipline, J. Energy Nat. Resource. Law, 14 (2) (1996), pp. 193-217
- Akash Agarwal, Renewable Energy Law: International and National Perspectives, 5 INT'l J.L. MGMT. & HUMAN. 1123 (2022).
- Anushka Chatterjee & Snigdha Sarkar, Market Structure of Renewable Energy in India: An Analytical Study, 3 Jus Corpus L.J. 340 (2023).
- Aparna Sawhney," Renewable Energy Policy in India: Addressing Energy Poverty and Climate Mitigation", Research Gate, June 2020.
- Chandrika Bothra, Navigating the Regulatory Environment for Renewable Energy in

India and Renewable Purchase Obligations, 14 GEO. Wash. J. ENERGY & ENV't L. 1 (2023).

- Deepak Sriram Krishnan, "India's Supreme Court Reinforces Renewable Energy Targets for Industry", World Resources Institute.
- Elisabeth Benecke, Networking for Climate Change: Agency in the Context of Renewable Energy Governance in India, 11 INT'l ENV't Agreements: POL. L. & Econs. 23 (2011).
- Gary E. Marchant, Sustainable Energy Technologies: Ten Lessons from the History of Technology Regulation, 18 WIDENER L.J. 831 (2009).
- Guatam Khurana, Renewable Energy in India: Current Status and Future Potential, Indiary Foundation, 2018
- K. Silvo, M. Melanen, A. Honkasalo, S. Ruonala, and M. Lindstrom, ―Integrated pollution prevention and control — The Finnish approach, Resour. Conserv. Recycle., vol. 35, no. 1-2, pp. 45–60,2002.
- Kumar. J, C.R., Majid, M.A. Renewable energy for sustainable development in India: current status, future prospects, challenges, employment, and investment opportunities. *Energy, Sustainability and Society* 10, 2 (2020)
- L. K. Price and A. T. McKane. (2008). Policies and measures to realise industrial energy efficiency and mitigate climate change. UN-Energy Energy Efficiency Cluster. [Online].
  Available:http://www.unido.org/fileadmin/user_media/Services/Energy_and_Climate_Change/EPU/UN%20Energy%202009%20Policies%20and%20Measures%20to%20realise%20Industrial%20Energy%20Efficiency%20and%20mitigate%20Climate%20Change_small.pdf
- Legislative History of the Renewable Energy and Energy Efficiency Technology Competitiveness Act of 1989 P.L. 101-218 (1989).
- Mayank Hitesh Thanki, Renewable Energy Laws in India, International Journal of Law Management & Humanities [ISSN 2581-5369], Volume 3 Issue 4, 2020.
- Margareth Sembiring, *Domestic Coal: A Hindrance to Renewable Energy Development,* NTS INSIGHT, No. IN 20-01 (Singapore: RSIS Centre for Non-Traditional Security Studies (NTS Centre), Nanyang Technological University Singapore 2020).
- Md Ershadul Karim, Abu Bakar Munir, Mohammad Ataul Karim, Firdaus Muhammad-Sukki, Siti Hawa Abu-Bakar, Nazmi Sellami, Nurul Aini Bani, and

Mohamad Zaki Hassan, *Energy Revolution for Our Common Future: An Evaluation of the Emerging International Renewable Energy Law,* 11 ENERGIES 1769 (2018).

- R. N. Stavins. (2001). Experience with market-based environmental policy instruments. resources for the future. [Online]. Available: http://www.rff.org/documents/rff-dp-01-58.pdf
- Singh Kirti, Competition Issues in Energy Sector in India: A Critical Legal Study, 2018
- Tejal Kanitkar, Is India Concerned about its Energy Security? The India Forum, Is India Concerned about its Energy Security? | The India Forum, 25th September, 2020.
- Tushar Shetty, Chirah Shetty, Ishaan Shah, Current scenario of renewable energy in India, International Research Journal of Engineering and Technology (IRJET), Volume: 08 Issue: 10, Oct 2021

Reports

- India, 2020 by International Energy Agency, NITI AAYOG
- BP. 2000. Statistical Review of World Energy. [Authoritative annual publication containing current and historical statistics on the world's commercial energy resources, production, and consumption. The current version can be downloaded from the BP web site.]
- Eden, R.; Posner, M.; Bending, R.; Crouch, E.; Stanislaw, J. 1981. Energy Economics: Growth, Resources and Policies. Cambridge, England, Cambridge University Press. 442 pp. [Comprehensive text on energy policy, although rather dated.]
- Indian Network for Climate Change Assessment, Ministry of Environment and Forests (2010), India: Greenhouse Gas Emissions 2007, Government of India, Ministry of Environment and Forests, New Delhi.
- NEI AAYOG, REPORT ON INDIAS RENEWABLE ELECTRICITY ROADMAP 2030: TOWARD ACCELERATED RENEWABLE ELECTRICITY DEPLOYMENT 29 (2015), https://policy.thinkbluedata.com/sites/default/files/Report-on- Indias-RE-Roadmap-2030-full-report-web2.pdf [https://perma.cc/WX2SYMEL].
- Planning Commission (2006), Integrated Energy Policy Report of the Expert Committee, Government of India, Planning Commission, New Delhi.